REMARKS

Applicant respectfully requests reconsideration of this application. Claims 16-44 are pending. Claims 16-44 are rejected.

35 USC § 103 Rejections

The Office Action mailed on August 19, 2003, rejects claims 16-44 under 35 USC 103 as allegedly being unpatentable over US Patent 5,859,789 (Sidwell) in view of Visual Instruction Set (VIS ™) User's Guide, Sun Microsystems, March 1997 (Sun).

With regard to Claims 16 and 35, the Office Action states that it would have been obvious to combine Sun's packed sum of absolute differences to Sidwell's system. Applicant respectfully disagrees with the Examiner's characterization of what Sidwell and Sun taught.

Sidwell admits that the multiply-add unit is capable of executing a single instruction, the result of executing that instruction being to multiply together respective pairs of objects from two operands and to add together the results to provide a final result (col. 7, lines 21-31). Sidwell also admits that operands for the packed arithmetic units 70-80 are supplied along the Source 1 and Source 2 busses 52, 54 (col. 5, lines 26-27).

The vis_pdist() instruction of Sun accumulates the absolute values of differences into a destination accumulator (p. 87, last paragraph). It is also shown by Sun that there is not a sum of absolute values without accumulation and therefore the accumulator must be initialized to zero prior to beginning execution of the vis_pdist() instructions (p. 88, 4.7.11 Example). Therefore, the vis_pdist() instruction of Sun has three source operands, one of which is also a destination (p. 88, first paragraph).

Sidwell's system provides no path for an accumulator input to packed arithmetic unit 6, for example, from result bus 56 or as a third source operand to packed arithmetic unit 6 (Figs. 1, 2, 4, and 6; col. 5, line 15 through col. 7, line 53). Therefore Sidwell's system could not perform Sun's packed sum of absolute differences without modifications, for example, to control unit 16 and packed arithmetic unit 6 to permit a third source operand for a packed arithmetic instruction. Applicant respectfully submits that no suggestion for such modifications is provided by Sidwell.

Accordingly in light of the above arguments, Claims 16 and 35 would not be obvious in view of the cited references. Applicant respectfully requests the Examiner withdraw the rejections of Claims 16 and 35 under 35 USC § 103.

With regard to Claims 17 and 26, the Office Action states that it would have been obvious to make the combined system of Sidwell and Sun, performing Sun's packed sum of absolute differences, compatible with the PENTIUM ™ microprocessor instruction set. Applicant respectfully disagrees.

The PENTIUM microprocessor instruction set has a well known opcode format, which permits two operands, one of the operands acting both as a source operand and a destination operand. As discussed above, the vis_pdist() instruction of Sun has three source operands, one of which is also a destination (p. 87, 4.7.11 Syntax and Description). Therefore a sum of absolute differences instruction with a two operand opcode format would not perform the operation defined by the vis_pdist() instruction of Sun without modification, and no suggestion of such a modification is provided. If it is possible to perform the operation defined by the vis_pdist() instruction of Sun using a two operand opcode format, Applicant submits that it is not at all obvious how to proceed.

Accordingly in light of the above arguments, Claims 17 and 26 would not be obvious in view of the cited references. Therefore, Applicant respectfully requests the Examiner withdraw the rejections of Claims 17 and 26 under 35 USC § 103.

With regard to Claims 18, 30 and 39, the Office Action states that Sun taught performing a packed subtract and write carry, a packed absolute value and a packed add horizontal. Applicant respectfully disagrees and notes that Claims 18, 30 and 39 set forth a packed subtract and write carry operation, a packed absolute value *and read carry* operation, and a packed add horizontal operation (emphasis added).

Sun states that "the pixels are subtracted from one another, pair wise, and the absolute values of the differences are accumulated into *accum.*" Sun does not teach a packed subtract and write carry operation or a packed absolute value and read carry operation, as set forth by Claims 18, 30 and 39. Sun does not discuss or suggest the writing of any carry state as part of a subtraction operation or the reading of any carry state as part of an absolute value operation.

Further, Sidwell admits that "The execution units 2, 4, 6 do not hold any state between instructions. Thus subsequent instructions are independent." (col. 4, lines 36-38) Therefore, it would not be obvious for the system of Sidwell to perform the packed subtract and write carry operation, or to perform the packed absolute value and read carry operation as set forth by Claims 18, 30 and 39.

Additionally, in the vis_pdist() instruction of Sun, the absolute values of the differences of pixels are accumulated into an accumulator, which would not be obvious to perform in the system of Sidwell, and would not suggest the packed add horizontal operation, as set forth by Claims 18, 30 and 39. Therefore, the packed add horizontal operation set forth by Claims 18, 30 and 39 is not obvious in view of the cited references.

Accordingly, Applicant respectfully requests the Examiner withdraw the rejections of Claims 18, 30 and 39 under 35 USC § 103.

The Office Action rejects claims 21-24, 33-34 and 43-44 under 35 USC 103 as allegedly being unpatentable over Sidwell in view of Sun and further in view of US Patent 5,721,697 (Lee).

With regard to Claims 21, 33 and 43, the Office Action states that it would have been obvious to combine Lee into a system of Sidwell and Sun to produce the features of the claims. Applicant respectfully disagrees with the Examiner's characterization of what Lee taught.

For example, Claims 21, 33 and 43, set forth a plurality of partial product selectors to insert an element of a plurality of elements of a packed data into and substituting for bit positions of one or more partial products and add the plurality of elements together.

On the other hand, Lee's method generates control inputs to force to logic zero bit positions that do not correspond to the bit positions of an element to be added. For example, forty-eight (48) bit positions are forced to logic zero in order to sum four 4-bit numbers (Table 6; cols. 6, lines 9-61). In order to sum eight 8-bit numbers, Lee would generate four hundred and forty-eight (448) control inputs to force to logic zero bit positions that do not correspond to the bit positions of the elements to be added together (Figure 3; col. 4, lines 11-52 and col. 5, lines 1-10).

Further, Lee aligns data from one input in partial products through use of another input value. Each bit of the second input value is set to zero except for a first subset of bits, starting with the low order bit which are set to one at intervals equal to a bit length of each addend (col. 1 lines 47-55). The vis_pdist() instruction of Sun already has three source operands, one of which is also the destination (p. 88, first paragraph). To perform the alignment in partial products as suggested by Lee a fourth source operand would be necessary. Sidwell's system provides no third path for source inputs to packed arithmetic unit 6, much less a fourth (Figs. 1, 2, 4, and 6; col. 5, line 15 through col. 7, line 53). Therefore Sidwell's system could not perform the alignment in partial products as disclosed by Lee for Sun's vis_pdist() instruction without substantial modification to the method or apparatus disclosed, and such modification, was not taught, suggested, or motivated by Lee or by Sidwell.

Accordingly in light of the above arguments, Claims 21, 33 and 43, would not be obvious in view of the cited references. Applicant respectfully requests the Examiner withdraw the rejections of Claims 21, 33 and 43, under 35 USC § 103.

Applicant therefore believes Claims 16, 26 and 39 are patently distinguished over the art cited by the Examiner. In addition to the arguments presented above, Applicant respectfully submits that Claims 17-25, 27-38, and 40-44 are also patentable, at least by way of being dependent from an allowable independent claim.

35 USC § 112 Second Paragraph Rejections

The Office Action rejects claims 17, 21-24, and 26-38 under 35 USC § 112 as allegedly being indefinite.

With regard to Claims 17 and 26, the Office Action states that the claim contain the trademark, "PENTUIM."

The presence of a trademark or trade name in a claim is not, per se, improper under 35 USC § 112, second paragraph, but the claim should be carefully analyzed to determine how the mark or name is used in the claim. Does its presence in the claim cause confusion as to the scope of the claim? MPEP 2173.05(u)

If the product to which the trademark refers is set forth in such language that its identity is clear, the examiners are authorized to permit the use of the trademark if it is distinguished from common descriptive nouns by capitalization. If the trademark has a fixed and definite meaning, it constitutes sufficient identification unless some physical or chemical characteristic of the article or material is involved in the invention (MPEP 608.01(v), par. 6).

Claims 17 and 26 set forth, respectively, a decode unit to decode and a processor to execute instructions of the PENTIUM microprocessor instruction set. Applicant respectfully submits that the instructions of the PENTIUM microprocessor instruction set are not a particular material or product. Applicant also submits that the PENTIUM microprocessor instruction set identifies the source of the instruction set in such a way that the scope of the subject matter embraced by the claim is fixed and definite. For example, numerous software engineers and hardware engineers rely upon the publicly available definition of the PENTIUM microprocessor instruction set in order to conduct business and to plan engineering projects. Applicant therefore submits that Claims 17 and 26 set out and circumscribe subject matter with a sufficient degree of precision and particularity to apprise one of skill in the art of each claim's respective scope.

Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of Claim 17 and 26 (and of Claims 26-32) under 35 USC § 112.

With regard to Claims 21 and 33, the Office Action states that it is unclear how the first operation can be performed by producing partial products (multiplication) when Claim 16 defines the first operation as a packed sum of absolute differences.

Applicant intends that Claims 21 and 33 set forth producing a first plurality of partial products in a multiplier having a plurality of partial product selectors in performing the first operation of the first set of operations initiated responsive to decoding the packed sum of absolute differences instruction.

Applicant further believes to produce a first plurality of partial products in a multiplier having a plurality of partial product selectors, as set forth in Claims 21 and 33, and to insert an element of a first plurality of elements of a first packed data into and substituting for bit positions of one or more of the first plurality of partial products by using partial product selectors corresponding to the bit positions, as further set forth in

Claims 21 and 33, defines subject matter of the claims with a reasonable degree of precision and particularity in accordance with MPEP § 2106, (roman numeral V. A. 2., p. 2100-19, second paragraph).

As further explained by the above-cited reference, applicant need not explicitly recite in the claims every feature of the invention. For example, Claims 21 and 33 do not limit the first set of operations to include a packed subtract and write carry operation and a packed absolute value and read carry operation. Applicant therefore submits that Claims 21 and 33 set out and circumscribe subject matter with a sufficient degree of precision and particularity to apprise one of skill in the art of each claim's respective scope.

Accordingly, Applicant requests that the Examiner withdraw the rejection of Claims 21 and 33 (and of Claims 22-24 and 33-38) under 35 USC § 112.

CONCLUSION

Applicant respectfully submits the present application is in condition for allowance and such action is earnestly solicited. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Lawrence Mennemeier at (408) 765-2194.

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Date: 1-20-2004

Lawrence M. Mennemeier
Reg. No. 51,003

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300